

REMARKS

The present invention relates to a polyester multifilament yarn; as claimed herein, the yarn comprises, as a principal component, polyethylene terephthalate polymer produced by polycondensing terephthalate diester of ethylene glycol in the presence of a catalyst.

In the Office Action of March 5, 2007, the Examiner indicated that claims 1 - 7 were rejected. More specifically, claims 1 - 7 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Kato et al (USP 6,316,101) or Fujimoto et al (USP 6,284,370). Furthermore, claims 1 - 7 were rejected under 35 U.S.C. § 103(a) Okumura et al (JP 54-45397) further in view of Cho et al (U.S. Publn. No. 2003/0059612); in this regard, the Examiner cited Okumura as disclosing a polymerization process of polyester in the presence of the identical catalytic system, but the Examiner recognized that Okumura was silent regarding the specific polyester for fiber related applications. Cho was cited as disclosing the use of polyester fibers for multifilament yarn with the same Dtex (denier) and Silk Factor as the present invention, based on which the Examiner asserted that the polyester obtained by the process of Okumura would be used for fiber related applications, such as tire cord. Lastly, claims 1 - 7 were rejected for double patenting based on allowed U.S. Patent Application No. 10/541,757. It is noted that no rejection was set forth with respect to pending claims 8 - 12.

In the present amendment, independent claim 1 has been amended, based on which it is respectfully submitted, as explained further below, that claims 1 - 7, and also claims 8 - 12 are novel, unobvious, and patentable over the cited prior art of record.

In amended claim 1, "polyester polymer" appearing in line 1 has been amended to --polyethylene terephthalate polymer--, and "an aromatic dicarbonate ester" has been amended to --terephthalate diester of ethylene glycol--. Also in the amendment of claim 1, the erroneous reference to the "phosphorus compound component (A)" (appearing on page 41 (claim 1), line 26 of the description), has been corrected to read --the phosphorus compound component (B)--.

These amendments to claim 1 are supported, e.g., by claim 5, by page 7, lines 10 to 12, and by page 17, line 23 to page 18, line 21, of the specification.

Further in view of the amendments to claim 1, the recitation regarding the reaction product (2) for the catalyst has been deleted.

For the Examiner's information, it is noted that Example 3 falls outside the scope of the amended claim 1.

The multifilament yarn as claimed in amended claim 1 has the following features.

(A) The multifilament yarn comprises, as a principal component, a polyethylene terephthalate polymer.

(B) The specific polyester polymer is one produced by polycondensing terephthalate diester of ethylene glycol in the presence of a specific catalyst.

(C) The specific catalyst comprises a mixture (1) of a titanium compound component (A) with a phosphorus compound component (B) as defined in the amended claim 1.

(D) The mixture (1) is employed in an amount satisfying the specific requirements (i) and (ii) for the amounts the titanium compound component (A) and the phosphorus compound component (B), as defined in the amended claim 1.

(E) The resultant polyester multifilament yarn having an individual filament thickness of 0.3 to 2.0 dtex and a total yarn thickness of 90 dtex or less, exhibits a specific silk factor value of 22 calculated from the tensile strength in CN/dtex and the ultimate elongation in of the multifilament yarn in accordance with the equation (1) as shown in the amended claim 1.

The combination of features (A) to (E) altogether enables the resultant polyester multifilament yarn to have a low thickness (0.3 to 2.0 dtex) of individual filaments, the exhibit good color tone (a high L* value and a low b* value) and a satisfactory silk factor value of 22 or more, and thus is capable of exhibiting, when the yarn is utilized with respect to a woven or knitted fabric usable for sport clothes, a sufficient mechanical strength, a high resistance to fuzzing, a good hand, and a good color tone.

The invention according to amended claim 1 relates to a polyester multifilament yarn comprising, as a principal component, a polyethylene terephthalate polymer, but not a poly(trimethylene) terephthalate polymer.

U.S. 6,384,370 31 (Fujimoto) relates to polyester fibers comprising 90% or more by weight of a poly(trimethylene terephthalate).

U.S. 6,310,101 B2 (Kato) relates to polyester fibers comprising at least 90% by weight of poly(trimethylene terephthalate).

Also, neither Fujimoto nor Kato disclose the polycondensation catalyst comprising the specific mixture (1) as defined in the amended claim 1.

Thus, the present invention as claimed in the amended claim 1 definitely distinguishes over the Fujimoto and Kato references.

Accordingly, Fujimoto and Kato do not anticipate the present invention as claimed in the amended claim 1.

JP-54-45397-A (Okumura et al)

Okumura discloses a method of producing a polyester polymer by polycondensing a glycol ester of a aromatic dicarboxylic acid or an oligomer thereof in the presence of a catalyst comprising a reaction product of a titanium compound which is a reaction product of a titanium alkoxide (the formula (I)) with an aromatic polycarboxylic acid (the formula (II) or an anhydride thereof), with a mono-, di- or tri-alkyl phosphate (the formula (III)). This phosphorus compound of the formula (III) of Okumura is definitely different from the phosphorus compound

represented by the formula (III) in the amended claim 1 for the present invention, for example, having a -C(=O)-X -group (in which X represents a -CH₂- or -CH(phenyl)- group.

Also, the catalyst usable for the present invention is a mixture of titanium compound component (A) with phosphorus compound component (B) as defined in the amended claim 1, whereas the catalyst for the method of Okumura consists of a reaction product (but not a mixture) of a titanium compound component with a phosphorus compound component.

Accordingly, Okumura does not teach or suggest the specific polyester multifilament yarn as claimed in amended claim 1 of the present application.

US 2003/0059612-A1 (Cho)

Cho discloses a polyester multi-filament yarn prepared from a solid phase-polymerized polyester chip. Namely, the polyester chip for the Cho invention must be prepared by a solid phase polymerization using an antimony (Sb) compound as a main polymerization catalyst.

Also, Cho is quite silent as to the specific polyethylene terephthalate polymer prepared in the presence of the catalyst comprising a mixture (1) of a titanium compound component (A) with a phosphorus compound component (B) as defined in the amended claim 1 for the present invention. Further, Cho does not teach or suggest the advantages of the present invention.

Accordingly, Cho does not teach or suggest, or provide any motivation or reason for deriving the specific polyester multifilament yarn as claimed in amended claim 1 of the present application.

In view of Cho, it is clear that the polyester polymer disclosed in Okumura and prepared in accordance with the polycondensation of ethylene glycol ester of aromatic dicarboxylic acid in the presence of a specific catalyst comprising a reaction product of a titanium compound with an alkyl phosphate ester as defined in Okumura, cannot be employed in place of the solid phase-polymerized polyester chip to produce the polyester multifilament yarn of Cho. Accordingly, there is no motivation or reason to be seen for employing the polyester polymer produced by the process of Okumura for the production of the fibers of the multifilament yarn as taught by Cho.

Accordingly, Okumura does not affect the unobviousness of the present invention as claimed in the amended claim 1, even in view of Cho.


With respect to allowed co-pending Application No. 10/541,757, a Terminal Disclaimer for the present application is submitted herewith.

In view of the above, allowance of examined claims 1 - 7 and claim 8 - 12 of this application are now believed to be in order, and such actions are hereby earnestly solicited.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the local Washington, D.C. telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


Joseph V. Ruch, Jr.
Registration No. 26,577

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

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